

TEXT OF THE FIRST OFFICE ACTION

The present application relates to a multilayered ceramic substrate and production method therefor.

1. Claim 1 asks to protect a method for producing multilayered ceramic substrate having a cavity. Comparison Document 1 (JP2000-25157A) has disclosed a method for producing multilayered ceramic substrate having a cavity. The disclosed technical features (See Figs 5-7 and Paragraphs 0031-0078 of the Description) are as follows: providing a first ceramic green sheet (the upper layer of reference sign 11) having an opening (reference sign 13) for forming a cavity and a second ceramic green sheet (the lower layer of reference sign 11) having no opening at a position corresponding to said opening of the first ceramic green sheet; providing an interlayer (reference sign 12) at a boundary between said first ceramic green sheet and said second ceramic green sheet; forming a green-sheet stack having a cavity defined by said opening by stacking said first ceramic green sheet, said second ceramic green sheet and said interlayer so that an aperture of said cavity is disposed on at least one end face of said stacked ceramic green sheets in a sheet-stacking direction and extends through a depth of said stack to an inner peripheral surface while positioning said interlayer along said boundary between said first ceramic green sheet and said second ceramic green sheet so that said interlayer is exposed at an end of said inner peripheral surface of said cavity; firing said green -sheet stack. Compared with Comparison Document 1, the difference of the technical solution of Claim 1 is to provide a shrinkage reducing layer comprising shrinkage-reducing material at a boundary between said first ceramic green sheet and said second ceramic green sheet, for reducing shrinkage stress produced at a boundary between said first ceramic green sheet and said second ceramic green sheet. However, the interlayer in Comparison Document 1 objectively plays the role of reducing the shrinkage stress produced at a boundary between said first ceramic green sheet and said second ceramic green sheet. Thus, Comparison Document 1 has disclosed all the technical features of Claim 1. And the technical solutions of Comparison Document 1 and Claim 1 belong to the same technical fields and can produce the same technical effects. Therefore, Claim 1 does not have the Novelty of Item 2, Article 22 of the Patent Law.

2. The additional technical feature of dependent Claim 2 is that said shrinkage-reducing layer is exposed on the entire periphery of the inner peripheral surface of said cavity as a shrinkage-reducing pad. However, said technical feature has been disclosed in Comparison Document 1. Therefore, when Claim 1 lacks Novelty, Claim 2 does not have the Novelty of Item 2, Article 22 of the Patent Law either.

3. The additional technical feature of dependent Claim 3 is that said shrinkage-reducing pad has a surface substantially parallel to a surface of said first ceramic green sheet defining said one end face and where said shrinkage-reducing pad surface has an area which is more than or equal to about 10% of the area of said surface of said first ceramic green sheet to which it is substantially parallel. However, said technical feature has been disclosed in Comparison Document 1. Therefore, when Claim 2 lacks Novelty, Claim 3 does not have the Novelty of Item 2, Article 22 of the Patent Law either.

4. The additional technical feature of dependent Claim 4 is that said shrinkage-reducing pad comprises a thick film layer having a planar surface substantially identical to that of said first ceramic green sheet along said boundary between said first ceramic green sheet and said second ceramic green sheet. However, "said shrinkage-reducing pad comprises a thick film layer" is common for the skilled person in the art. And the "shrinkage-reducing pad having a planar surface substantially identical to that of said first ceramic green sheet along said boundary between said first ceramic green sheet and said second ceramic green sheet" has been disclosed in Comparison Document 1. Therefore, when Claim 2 lacks Novelty, Claim 4 does not have the Inventiveness of Item 3, Article 22 of the Patent Law.

5. The additional technical feature of dependent Claim 5 is that said shrinkage-reducing pad has a thickness which is less than or equal to about 20% of the depth of said cavity. However, these technical features have been disclosed in Comparison Document 1. Therefore, when Claim 2 lacks Novelty, Claim 5 does not have the Novelty of Item 2, Article 22 of the Patent Law.

6. Claim 13 asks to protect a multilayered ceramic substrate having a stack adapted to be fired. However, Comparison Document 1 has also disclosed a multilayered ceramic substrate. The disclosed technical features are as follows: The stack comprises a first ceramic green sheet having an opening defining a cavity; a second ceramic green sheet having no opening at a position corresponding to said opening; said first ceramic green sheet and said second ceramic green sheet being stacked, and the cavity defined by said opening having an aperture on at least one end face of the stacked layers in a sheet-stacking direction and extending to an inner peripheral surface defined by said second ceramic green sheet; an interlayer disposed at all or a part of a boundary between said first ceramic green sheet and a second ceramic green sheet so as to be exposed at an end of the inner peripheral surface of said cavity. The difference between the technical solutions of Claim 13 and Comparison Document 1 is that in Claim 13, a shrinkage-reducing layer comprising a shrinkage-reducing material disposed at all or a part of a boundary between said first ceramic green sheet and a second ceramic green sheet for reducing shrinkage stress produced at said interface between said first ceramic green sheet and said second ceramic green sheet during said firing process. However, the interlayer in Comparison Document 1 objectively plays the role of reducing shrinkage stress produced at said interface between said first ceramic green sheet and said second ceramic green sheet during said firing process. Thus, Comparison Document 1 has disclosed all the technical features of Claim 13. Furthermore, the technical solutions of Comparison Document 1 and Claim 13 belong to the same technical field and they can bring the same technical effect. Therefore, the claim does not have the Novelty of Item 2, Article 22 of the Patent Law.

7. The additional technical feature of dependent Claim 14 is that said shrinkage-reducing layer is exposed on the entire periphery of the inner peripheral surface of said cavity as a shrinkage-reducing pad. However, this technical feature has been disclosed in Comparison Document 1. Therefore, when Claim 13 lacks Novelty, Claim 14 does not have the Novelty of Item 2, Article 22 of the Patent Law.

8. The additional technical feature of dependent Claim 15 is that said shrinkage-reducing pad has a surface substantially parallel to a surface of

said first ceramic green sheet defining said one end face and wherein said shrinkage-reducing pad surface has an area which is more than or equal to about 10% of the area of the surface of said first ceramic green sheet to which it is parallel and a thickness which is less than or equal to about 20% of the depth of said cavity. However, this technical feature has been disclosed in Comparison Document 1. Therefore, when Claim 14 lacks Novelty, Claim 15 does not have the Novelty of Item 2, Article 22 of the Patent Law.

9. The additional technical feature of dependent Claim 18 has been disclosed in Comparison Document 1. Therefore, when Claim 13, to which it refers, lacks Novelty, Claim 18 does not have the Novelty of Item 2, Article 22 of the Patent Law.

10. The additional technical feature of dependent Claim 19 is that said first ceramic layer and said second ceramic layer are fired ceramic layers. However, the first and second ceramic layers in all the embodiments of the Description are green ceramic layers rather than fired ceramic layers. Therefore, Claim 19 can not be supported by the Description, not conforming to the provision of Item 4, Article 26 of the Patent Law. Furthermore, the fired ceramic layers are common for the skilled person in the art. Therefore, when Claim 13 lacks Novelty, Claim 19 does not have the Inventiveness of Item 3, Article 22 of the Patent Law.

11. Independent Claim 20 asks to protect a multilayered ceramic substrate, but it is defined by the method for producing multilayered ceramic substrate of Claim 1. First, it does not conform to the provision of Item 1, Rule 20 of the Implementing Regulations of the Patent Law on the statement of independent claims. Second, Claim 20 is a product claim, so it should be defined by the product features, i.e., the structure, composition and/or performance parameters of the multilayered ceramic substrate. However, the multilayered ceramic substrate of Claim 20 is defined only by the features of the producing method. Therefore, the protection range of Claim 20 is not clear, not conforming to the provision of Item 1, Rule 20 of the Implementing Regulations of the Patent Law. On the other hand, the technical solution of Claim 20 is exactly the same as that of Claim 13, so Claim 20 does not conform to the provision of Item 1, Rule 20 of the Implementing Regulations of the Patent Law that

"The claims shall define clearly and concisely the matter for which protection is sought in terms of the technical features of the invention". Meanwhile, when Claim 13 lacks Novelty, Claim 20 does not have the Novelty of Item 2, Article 22 of the Patent Law.

Moreover, the present application has the following defects.

(I) Claims

The additional technical feature of **Claim 10** is that "a glass component contained in said shrinkage-reducing pad is the same as a glass component contained in said first and second ceramic green sheets", which is the same as that of Claim 9 "said glass components contained in said shrinkage-reducing pad and said first and second ceramic green sheets have a common constituent". Therefore, the protection ranges of Claims 9 and 10 are exactly the same, Claim 10 does not conform to the provision of Item 1, Rule 20 of the Implementing Regulations of the Patent Law that "The claims shall define clearly and concisely the matter for which protection is sought in terms of the technical features of the invention".

(II) Description

The abstract and the part of "Summary of the Invention" should be modified according to the amended independent claims.

Because of the above-mentioned reasons, this application can not be granted a patent right. The applicant shall amend the existing application documents according to the aforesaid examination observations, and submit the amended application documents within the time limit specified in this Notice. Otherwise, the application will be rejected. The applicant shall note that the amendment of the application documents shall conform to Article 33 of the Chinese Patent Law, not going beyond the scope of the disclosure contained in the initial description and claims.